

**WHAT IS CLAIMED IS:**

1. An Ethernet Digital Subscriber Line Access Multiplexer (DSLAM) for providing dynamic service selection  
5 and end-user configuration of service bindings in a digital communication system, said Ethernet DSLAM comprising:

means for receiving login credentials and a service request from an end-user device;

10 means for authenticating the login credentials through an authentication server;

means for receiving from the authentication server, a plurality of attributes for configuring the Ethernet DSLAM to provide a service binding corresponding to the requested service, said attributes including an identification of an  
15 access network for the requested service, and an identification of a Permanent Virtual Circuit (PVC) on a local DSL loop associated with the end-user device; and

means for training a bridging network terminal (NT) having a plurality of PVCs to utilize the identified PVC for  
20 sending upstream traffic from the end-user terminal to the Ethernet DSLAM, said training means including means for sending initial downstream traffic from the Ethernet DSLAM to the end-user device utilizing the identified PVC.

25 2. The Ethernet DSLAM of claim 1, wherein the end-user device has a Media Access Control (MAC) address, and the requested service is accessed through a Service Virtual Local Area Network (S-VLAN), and the Ethernet DSLAM includes means for mapping the S-VLAN for the requested service to  
30 the MAC address for the end-user device.

3. The Ethernet DSLAM of claim 1, wherein the means for receiving login credentials and a service request from an end-user device includes a User Virtual Local Area

Network (U-VLAN) through which the Ethernet DSLAM communicates with the end-user device, and the requested service is accessed through a Service Virtual Local Area Network (S-VLAN), and the Ethernet DSLAM includes means for  
5 mapping the S-VLAN for the requested service to the U-VLAN for the end-user device.

4. The Ethernet DSLAM of claim 1, wherein the means for authenticating includes a RADIUS client that  
10 communicates with an external RADIUS authentication server.

5. An Ethernet Digital Subscriber Line Access Multiplexer (DSLAM) for providing dynamic service selection and end-user configuration of service bindings in a digital  
15 communication system, said Ethernet DSLAM comprising:

a plurality of subscriber ports for receiving login credentials and service requests from end-user devices, and for communicating data traffic to and from the end-user devices, wherein an identified subscriber port communicates  
20 with an identified end-user device;

a traffic mapper that maps data traffic between a plurality of Service Virtual Local Area Networks (S-VLANs) and the subscriber ports;

a RADIUS client that sends login credentials and a  
25 service request from the identified end-user device to an external RADIUS server for authentication and receives from the external RADIUS server, a plurality of attributes for configuring the Ethernet DSLAM to provide a service binding corresponding to the requested service, said attributes  
30 including an identification of an S-VLAN through which the requested service is accessed, and an identification of a Permanent Virtual Circuit (PVC) on a local DSL loop associated with the end-user device; and

a Service Selection Controller that receives the attributes from the RADIUS client and sends mapping control information to the traffic mapper, thereby enabling the traffic mapper to establish a service binding between the identified end-user device and the S-VLAN through which the requested service is accessed.

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6. The Ethernet DSLAM of claim 5, wherein the service binding is established utilizing the IEEE802.1x protocol.

7. The Ethernet DSLAM of claim 5, wherein the service binding is established utilizing the Point-to-Point Protocol over Ethernet (PPPoE) protocol.

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8. The Ethernet DSLAM of claim 5, further comprising a Dynamic Host Configuration Protocol (DHCP) server that answers DHCP requests sent by the identified end-user device prior to establishment of the service binding, said DHCP server sending a temporary configuration and a short lease time to the identified end-user device.

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9. The Ethernet DSLAM of claim 8, wherein the DHCP server ignores DHCP requests sent by the identified end-user device after establishment of the service binding, thereby forcing the end-user device to broadcast a DHCP discover message which is passed on to a second DHCP server in the S-VLAN through which the requested service is accessed.

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10. A method of providing dynamic service selection and end-user configuration of service bindings in a digital communication system, said method comprising the steps of:

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sending login credentials and a service request from an end-user device to an Ethernet Digital Subscriber Line Access Multiplexer (DSLAM);

sending the login credentials and service request from the Ethernet DSLAM to an authentication server;

5 sending from the authentication server to the Ethernet DSLAM, a plurality of service binding attributes, said attributes including an identification of an access network for the requested service, and an identification of a Permanent Virtual Circuit (PVC) on a local DSL loop associated with the end-user device;

10 utilizing the service binding attributes by the Ethernet DSLAM to configure a service binding corresponding to the requested service; and

15 training a bridging network terminal (NT) having a plurality of PVCs to utilize the identified PVC for sending upstream traffic from the end-user terminal to the Ethernet DSLAM, said training step including sending initial downstream traffic from the Ethernet DSLAM to the end-user device utilizing the identified PVC.

20 11. The method of claim 10, wherein the end-user device has a Media Access Control (MAC) address, and the requested service is accessed through a Service Virtual Local Area Network (S-VLAN), and the step of utilizing the service binding attributes by the Ethernet DSLAM to configure a service binding includes mapping by the Ethernet  
25 DSLAM, the S-VLAN for the requested service to the MAC address for the end-user device.

30 12. The method of claim 10, wherein the Ethernet DSLAM communicates with the end-user device through a User Virtual Local Area Network (U-VLAN), and the requested service is accessed through a Service Virtual Local Area Network (S-VLAN), and the step of utilizing the service binding attributes by the Ethernet DSLAM to configure a service binding includes mapping by the Ethernet DSLAM, the S-VLAN

for the requested service to the U-VLAN for the end-user device.

13. The method of claim 10, wherein the step of  
5 sending the login credentials and service request from the Ethernet DSLAM to an authentication server includes sending the login credentials and service request from a RADIUS client in the Ethernet DSLAM to an external RADIUS authentication server.

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14. A method of providing dynamic service selection and end-user configuration of service bindings in a digital communication system, said method comprising the steps of:

15 configuring in an Ethernet Digital Subscriber Line Access Multiplexer (DSLAM), a plurality of subscriber ports for communicating with a plurality of end-user devices;

receiving login credentials and a service request from an identified end-user device utilizing an identified subscriber port;

20 sending the login credentials and the service request from a RADIUS client in the Ethernet DSLAM to an external RADIUS server for authentication;

25 receiving from the external RADIUS server, a plurality of attributes for a service binding corresponding to the requested service, said attributes including an identification of a Service Virtual Local Area Network (S-VLAN) through which the requested service is accessed, and an identification of a Permanent Virtual Circuit (PVC) on a local DSL loop associated with the end-user device;

30 configuring the Ethernet DSLAM to provide the service binding corresponding to the requested service; and

mapping data traffic by the Ethernet DSLAM between the S-VLAN through which the requested service is accessed and



the identified subscriber port communicating with the identified end-user device.

15 15. The method of claim 14, wherein the service binding is established utilizing the IEEE802.1x protocol.

16. The method of claim 14, wherein the service binding is established utilizing the Point-to-Point Protocol over Ethernet (PPPoE) protocol.

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17. The method of claim 14, further comprising the steps of:

receiving by the Ethernet DSLAM, a Dynamic Host Configuration Protocol (DHCP) request from the identified  
15 end-user device prior to establishment of the service binding; and

sending an answer to the end-user device from a DHCP server in the Ethernet DSLAM, wherein the answer includes a temporary configuration and a short lease time.

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18. The method of claim 14, further comprising the steps of:

receiving by the Ethernet DSLAM, a Dynamic Host Configuration Protocol (DHCP) request from the identified  
25 end-user device;

determining by the Ethernet DSLAM, whether the service binding has been established;

upon determining that the service binding has not been established, sending an answer to the end-user device from a  
30 DHCP server in the Ethernet DSLAM, wherein the answer includes a temporary configuration and a short lease time; and

upon determining that the service binding has been established, ignoring the DHCP request, thereby forcing the

end-user device to broadcast a DHCP discover message which is passed on to a second DHCP server in the S-VLAN through which the requested service is accessed.